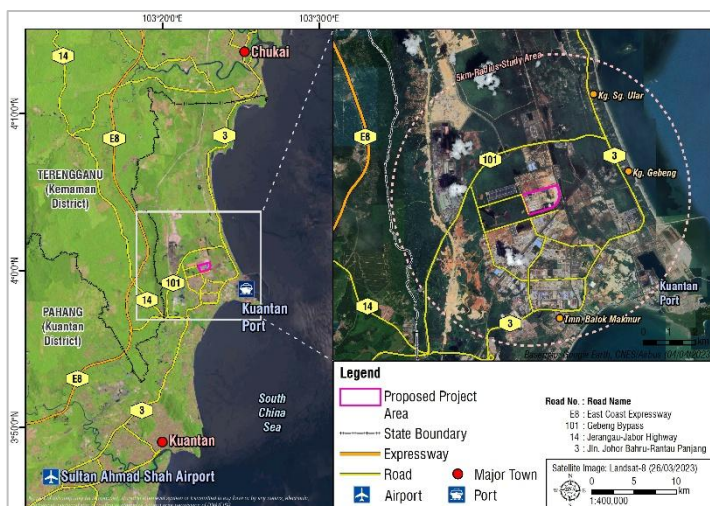


Executive Summary

PROJECT TITLE

The Proposed Rare Earth Mineral Processing of 110,000 MT/year Lanthanide Concentrate (LC) and 69,000 MT/year Mixed Rare Earth Carbonate (MREC) at Lynas Advanced Materials Plant (LAMP), Gebeng Industrial Estate (GIE), Balok, Pahang.

PROJECT LOCATION



- Within Gebeng Industrial Estate (GIE), Kuantan District, Pahang.
- Accessible via:
 - a) East Coast Expressway (E8) from south; and
 - b) Jerengau – Jabor Highway (Federal Route 14) from north, then by Federal Route 101 (Gebeng Bypass).

PROJECT BACKGROUND

- Lynas Malaysia Sdn. Bhd. (Lynas) has been involved in rare earth mineral processing operation, specifically on lanthanides, since 2012 at the LAMP facility.
- LAMP's operating licence was renewed by the Department of Atomic Energy (ATOM Malaysia) from 3rd March 2026 until 2nd March 2036.
- Lynas now intends to:
 - a) increase LC production capacity from 95,000 to 110,000 MT/year; and
 - b) process a new non-radioactive feedstock, MREC, to be added to the existing process line at LAMP along with LC.

PROJECT PROPONENT

Lynas Malaysia Sdn. Bhd.
 PT 17212, Jalan Gebeng 3,
 Kawasan Perindustrian Gebeng,
 26080 Kuantan,
 Pahang Darul Makmur.

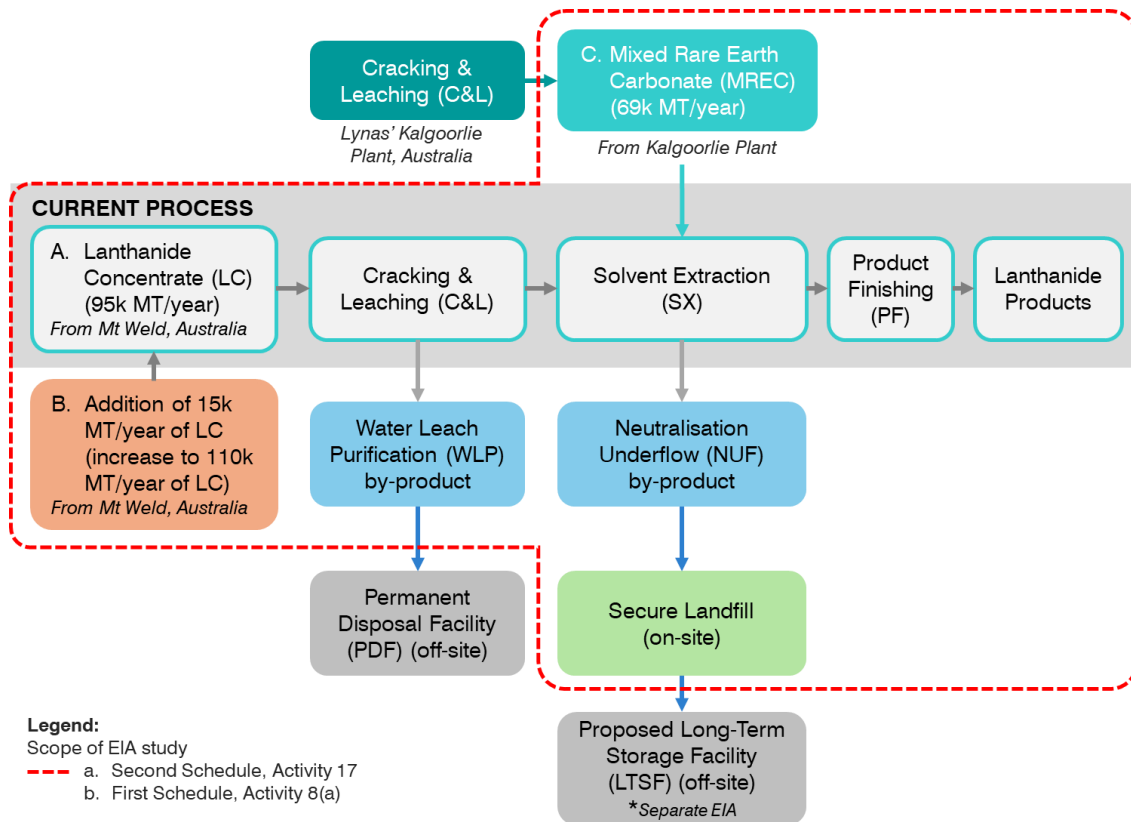
Contact Person: Dato' Sri Mashal Ahmad
 (Vice President)
 Telephone: +609 – 582 5200
 Facsimile: +609 – 582 5291
 E-mail: Mashal.Ahmad@lynasre.com

EIA CONSULTANT

DNA Environment Sdn. Bhd.
 No. 24, Jalan Wangsa Delima 6,
 Kuala Lumpur Suburban Centre (KLSC),
 Section 5, Pusat Bandar Wangsa Maju,
 53300 Kuala Lumpur.

Contact Person: Rosniza Ramli
 (EIA Study Team Leader)
 Telephone: +603 - 4145 8888
 Facsimile: +603 - 4145 8877
 E-mail: environment@drnik.com.my

SCOPE OF EIA



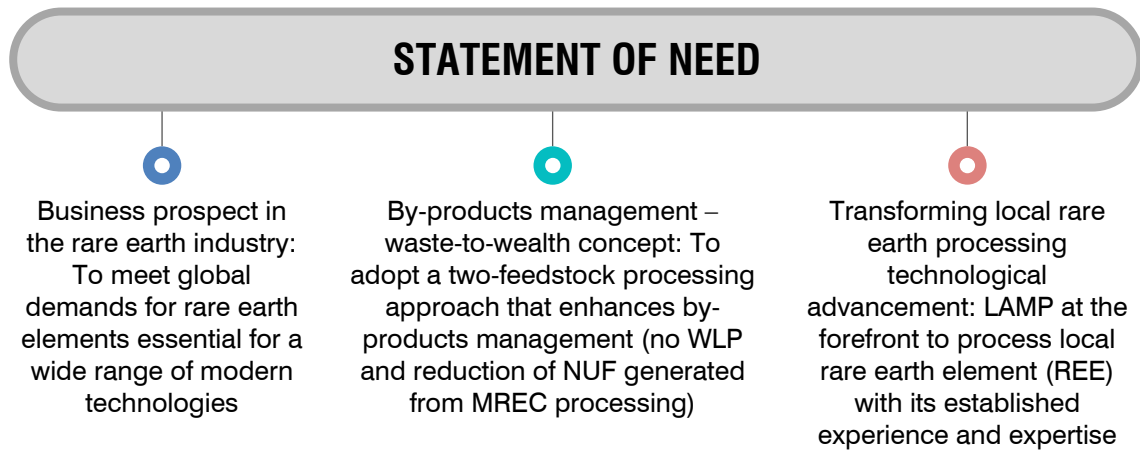
LEGAL REQUIREMENTS

Environmental Quality Act (EQA) 1974 Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015	
Prescribed Activity	Relevancy to the Project
<ul style="list-style-type: none"> ■ Second Schedule: Activity 17 – Radioactive Materials and Radioactive Waste Any activity specified in this Schedule and the First Schedule using radioactive materials and generating radioactive wastes. 	<p>Increase in LC processing capacity (radioactive materials) to 110,000 MT/year, consequently increasing the generation of WLP by-product (radioactive waste).</p>
<ul style="list-style-type: none"> ■ First Schedule: Activity 8 – Mining (a) Ore processing outside mineral tenement area, including concentrating of aluminium, copper, gold, iron, tantalum or rare earth element. 	<p>Mineral processing of LC and MREC, two feedstocks classified as “mineral ores” by the Department of Mineral and Geoscience (JMG) Malaysia.</p>
Related EQA 1974 Regulations	
<ul style="list-style-type: none"> ■ Environmental Quality (Clean Air) Regulations 2014 ■ Environmental Quality (Industrial Effluent) Regulations 2009 ■ Environmental Quality (Scheduled Wastes) Regulations 2005 	
Atomic Energy Licensing Act (AELA) 1984	
<p>The Project Proponent possesses a Full Operating Stage Licence (FOSL) (Licence No.: LPTA/A/1333-42632), and Classes A, C, D, E, and G Licences for LAMP operation until March 2036, granted by ATOM Malaysia.</p>	
Related AELA 1984 Regulations	
<ul style="list-style-type: none"> ■ Atomic Energy Licensing (Radioactive Waste Management) Regulations 2011 ■ Atomic Energy Licensing (Basic Safety Radiation Protection) Regulations 2010 ■ Radiation Protection (Transport) Regulations 1989 ■ Radiation Protection (Licensing) Regulations 1986 	
Mineral Development Act (MDA) 1994	
<p>The Project Proponent possesses a mineral processing licence (Licence No: LMM/PHG/0053) until October 2029, granted by JMG Pahang.</p>	
Related MDA 1994 Regulations	
<ul style="list-style-type: none"> ■ Mineral Development (Effluent) Regulations 2016 ■ Mineral Development (Licensing) Regulations 2016 	



TERMS OF REFERENCE (TOR)

The TOR of the EIA was endorsed by the Department of Environment (DOE) Headquarters on 26th December 2024 [Ref: JAS.600-2/22/4 Jilid 2(6)].



PROJECT OPTIONS

No major alternative considered.

Site Option

The LAMP in the GIE (gazetted for industrial activities), operational since 2012

Technology Option

LAMP is well-equipped with Best Available Technologies (BAT) for rare earth processing and pollution controls

Project Option

- **With-Project:** Increase LAMP's overall production capacity through efficient and enhanced operation
- **No-Project:** LAMP remain in its status quo with sole processing of 95,000 MT/year LC only and no new opportunities for economic growth at the state and national level

PROJECT COMPONENTS

Feedstocks		
Feedstock to be processed at LAMP	LC (existing with 15.8% increment)	MREC (new)
Quantity (MT/year)	110,000	69,000
Processing Stage	Starts at C&L (Stage 1)	Starts at SX (Stage 2)
Description	Concentrated lanthanide ores are mined in Mount Weld, Western Australia	Intermediate product of LC produced at Lynas' plant in Kalgoorlie, Western Australia
Chemical properties	REO: 33.5%, Contaminants: 52.7%, Moisture: 13.8%	REO: 587.9 g/kg, Contaminants: 256.41 g/kg
Radioactivity (ATOM Malaysia limit = 1 Bq/g)	Classified as NORM: Th-232 at 4.69 Bq/g (>1 Bq/g)	Not radioactive: Activity concentrations of thorium, uranium, or their progenies are all below the 1 Bq/g limit

Note: C&L = Cracking and Leaching; SX = Solvent Extraction; REO = rare earth oxide; NORM = naturally occurring radioactive material

Products

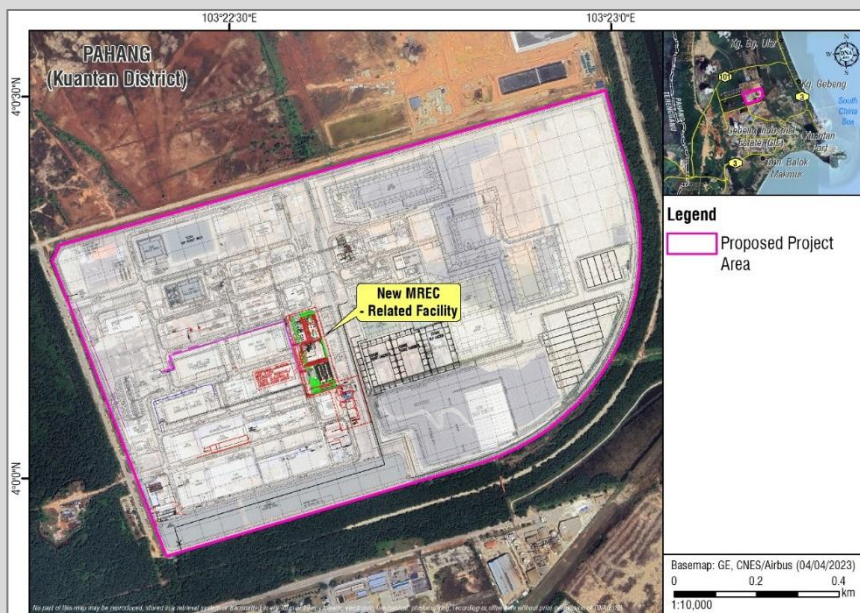
Total project production: Approx. 32,599 MT/year.

The Proposed Rare Earth Mineral Processing of 110,000 MT/year LC & 69,000 MT/year MREC at Lynas Advanced Materials Plant (LAMP), Gebeng Industrial Estate, Pahang

By-products		
By-product generated at LAMP	WLP (radioactive)	NUF (scheduled waste)
Origin	From C&L process	From SX and WGT processes
Category	NORM – Very Low-Level Waste (VLLW)	SW205
Properties	Radioactivity: Th-232 = 6.3 Bq/g; Ra-228 = 6.5 Bq/g	Non-radioactive, non-toxic and no inherent physical hazards
Current Management Practice	Disposed of at an off-site Permanent Disposal Facility (PDF): EIA approved in 2021, and on-site Residue Storage Facility (RSF)	Stored at an on-site Secure Landfill (SL): EIA approved in 2019
Research & Development (R&D)	Thorium extraction (ThX) project: <ul style="list-style-type: none"> Compliance with LAMP’s operating licence Condition #33.2: R&D Implementation by March 2031 	<ul style="list-style-type: none"> Extensive R&D since 2012 Proven potential applications as soil conditioner, road base material and alternative engineered buffer material

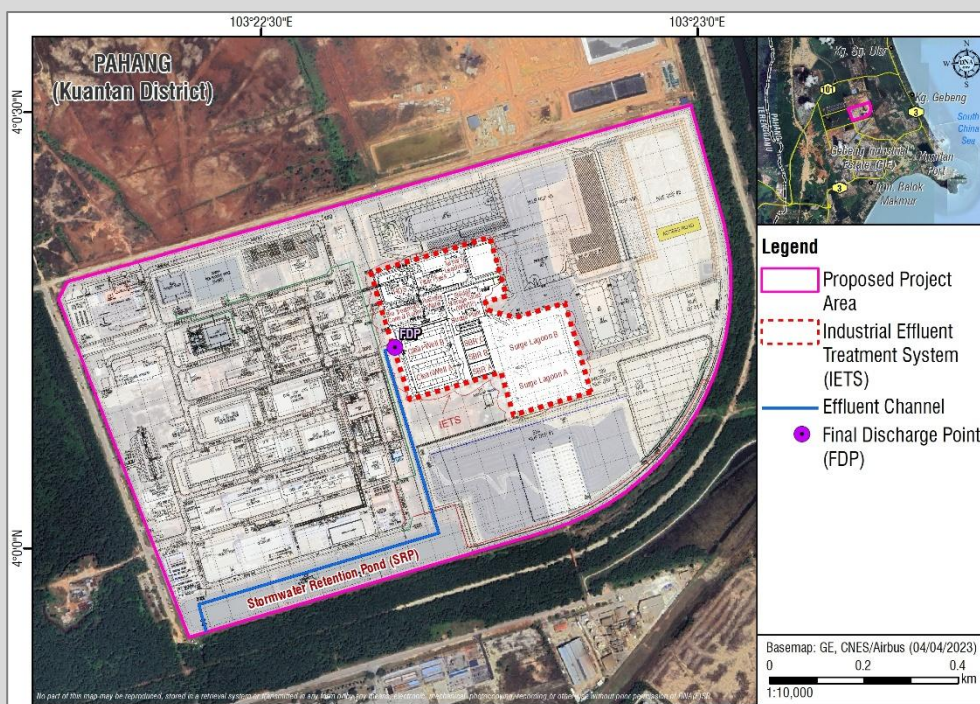
Note: WGT = Waste Gas Treatment

MREC-related facilities



Installation completed in mid-2024 per DOE’s approval

Industrial Effluent Treatment System (IETS)



- Wastewater at the LAMP goes through physicochemical and biological treatments at the IETS before being discharged at the Final Discharge Point (FDP)
- Effluent regulatory compliance:
 - a) Environmental Quality (Industrial Effluent) Regulation 2009 [Standard B]
 - b) Mineral Development (Effluent) Regulations 2016 [Column (4) of the Regulations' Schedule]

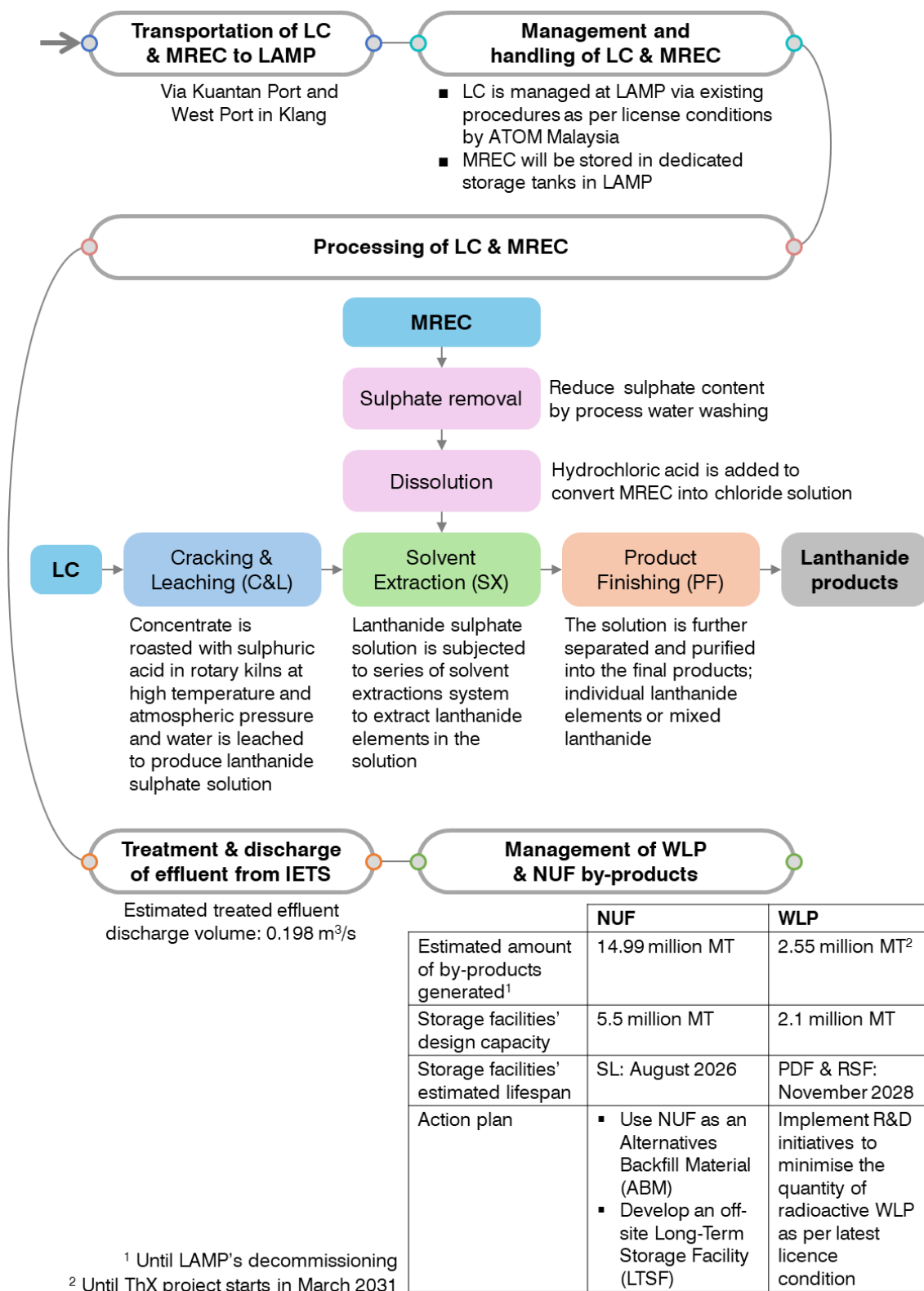
Air Pollution Control System (APCS)

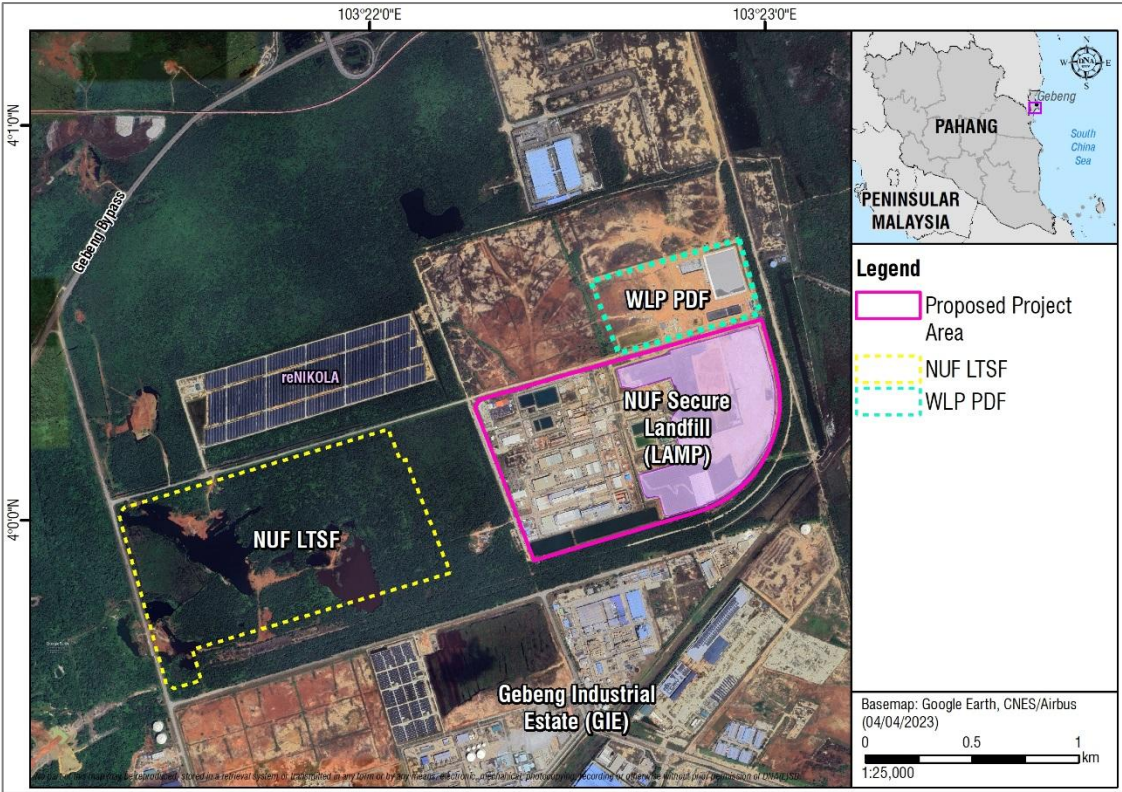
- Existing: Waste Gas Treatment System (WGTS), scrubbers, dust collectors, boilers and tunnel furnaces
- New: Scrubbers (2) and dust collector (1) – to support MREC processing

MREC Test Run (Pilot Trial)

- The Proponent has requested to conduct test run (pilot trial) studies of the LC-MREC processing at LAMP, which have been approved by DOE HQ in January 2024 and December 2025
- Key findings comparison between the first and second test run studies:
 - a) Significant reduction of sodium carbonate consumption by 36%
 - b) Raw water consumption increased due to residual sulphate content (2 wt%) removal process
 - c) Decrease in NUF generated by 3%
 - d) Wastewater effluent quality remains within regulatory discharge limits

PROJECT ACTIVITIES





PROJECT IMPLEMENTATION SCHEDULE

Commencement of proposed project – 3rd quarter of 2026.

EXISTING ENVIRONMENT

Physical Environment



CLIMATE

- Exhibit consistency in temperature, high humidity and copious rainfall



LAND USE

- Administration: Under Kuantan City Council (MBK)
- Main land use type: Vacant land, Forest and Industries



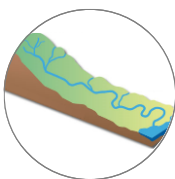
TOPOGRAPHY

- Located in a predominantly flat, low-lying area
- Elevation: 4 to 10.06 m



SOIL

- Heavy metals detected were all below the Contaminated Land Management and Control Guideline (CLMCG) and industrial soil Site Screening Levels (SSL)
- Most of the elevated heavy metals are attributed to naturally occurring minerals, influenced by site's geological characteristics and environmental conditions



HYDROLOGY & DRAINAGE

- Located in River Basin Management Unit (RBMU) No. 58 of Sungai Baluk Catchment
- Flood-prone areas are mostly further south and southeast of the Project site
- No flood cases reported at the project site and its surrounding since 2011



TSUNAMI & SEA LEVEL RISE

- Categorized as Zone 2 (lower risk)
- Sufficiently protected against sea level rise effects



GEOLOGY

- GIE is underlain mainly by Quaternary deposits with sedimentary and metasedimentary bedrock
- Seismic hazard in East Pahang has a very low potential of 2 to 3% g



HYDROGEOLOGY

- The aquifer system comprises silty-sand with traces of gravel, decomposed roots and peat.
- The groundwater is generally potable and fresh with total dissolved solid (TDS) load below 1,500 mg/L



SURFACE WATER

- Moderate biochemical oxygen demand (BOD), chemical oxygen demand (COD) and ammoniacal nitrogen ($\text{NH}_3\text{-N}$) levels in Sungai Baluk, around Classes II to III of National Water Quality Standards
- Sodium, chloride, calcium and sulphate were high upon discharge from LAMP but subsided at post-confluence with Sungai Baluk
- Marine water indicated good water quality



GROUNDWATER

- All parameters complied with the National Groundwater Quality Standards limits, except for:
 - a) BOD and COD – attributed to humic substance originating from peat soil
 - b) Ammonia, magnesium, sodium, chloride, and sulphate – influence from marine environmental deposition
 - c) Iron and manganese – typical of tropical groundwater



SEDIMENT

- Most metals analysed were categorised as Non-Polluted as per USEPA guidelines, except for chromium and arsenic. High arsenic may result from high-arsenic concentration deposition of alluvial sediments, contributed by the weathering of arsenic-rich minerals



AIR

- All air quality parameters were well within the stipulated limits of the New Malaysia Ambient Air Quality Standard (NMAAQS) 2020



NOISE

- Recorded ambient noise during daytime and night-time ranged from 50.0 dBA to 58.1 dBA
- These values were lower than the permissible sound level (75 dBA)



VIBRATION

- The vibration results ranged between 0.127 and 0.315 mm/s, which were well below the safe limit of 0.8 mm/s



RADIOLOGICAL LEVEL

- Soil, water and sediment radioactivity levels remained within natural background ranges, while suspended solids and airborne dust were exceptionally low
- Overall, most doses were well below regulatory limits



TRAFFIC

- All junctions and mid-blocks were performing at acceptable conditions during peak hours between levels of service (LOS) A and C

Biological Environment



FISH

- 4 species of freshwater fish and 12 species of marine fish were identified



PLANKTON

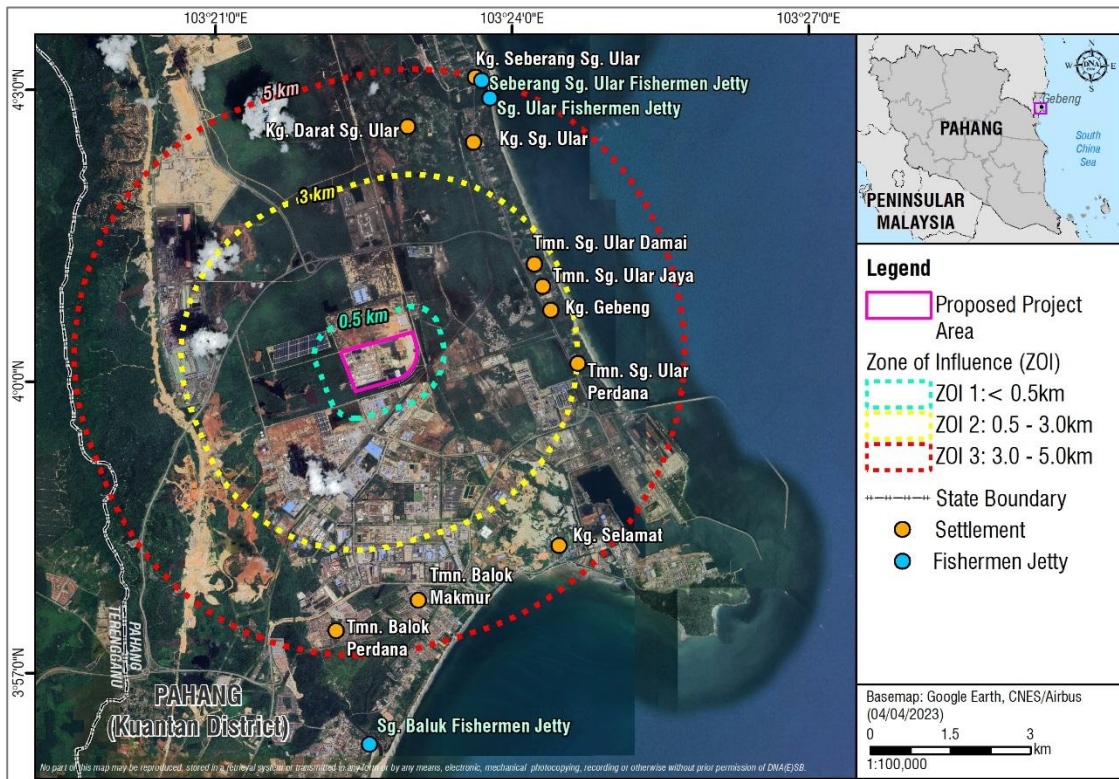
- Phytoplankton samples were dominated by *Cyclotella* and *Nitzschia* genera
- *Rotifera* families dominate the zooplankton community in the freshwater zones



MACROBENTHOS

- Phylum Mollusca and Arthropoda were the most prevalent macrobenthos within the study area

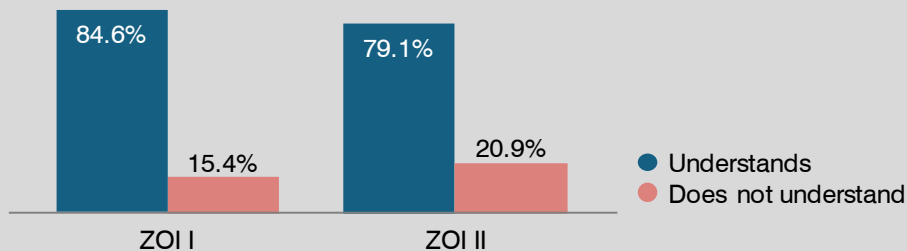
Human Environment



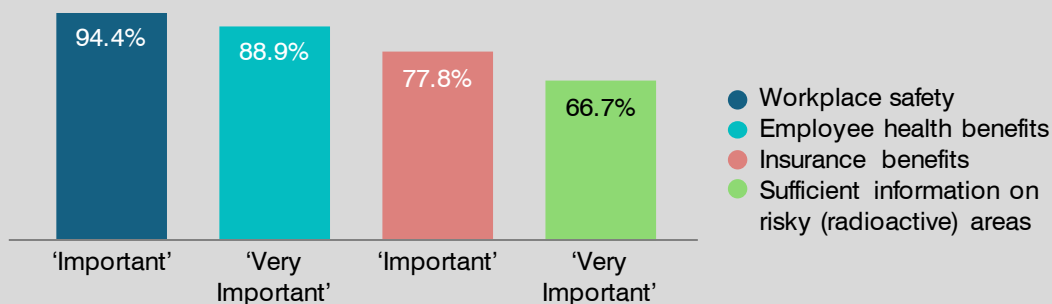
Zone of Influence (ZOI) for socio-economic survey

Socio-economy

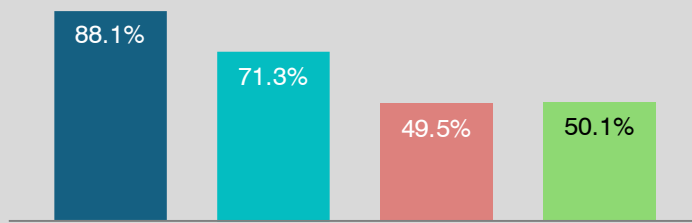
Awareness of the project (local community and fishermen):



Level of importance and consideration:

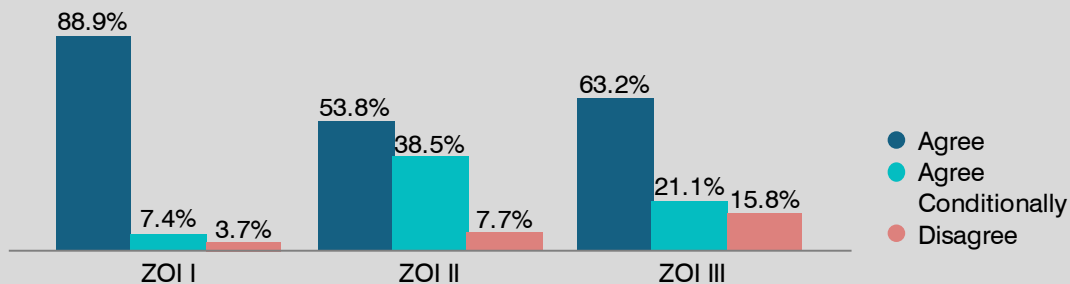


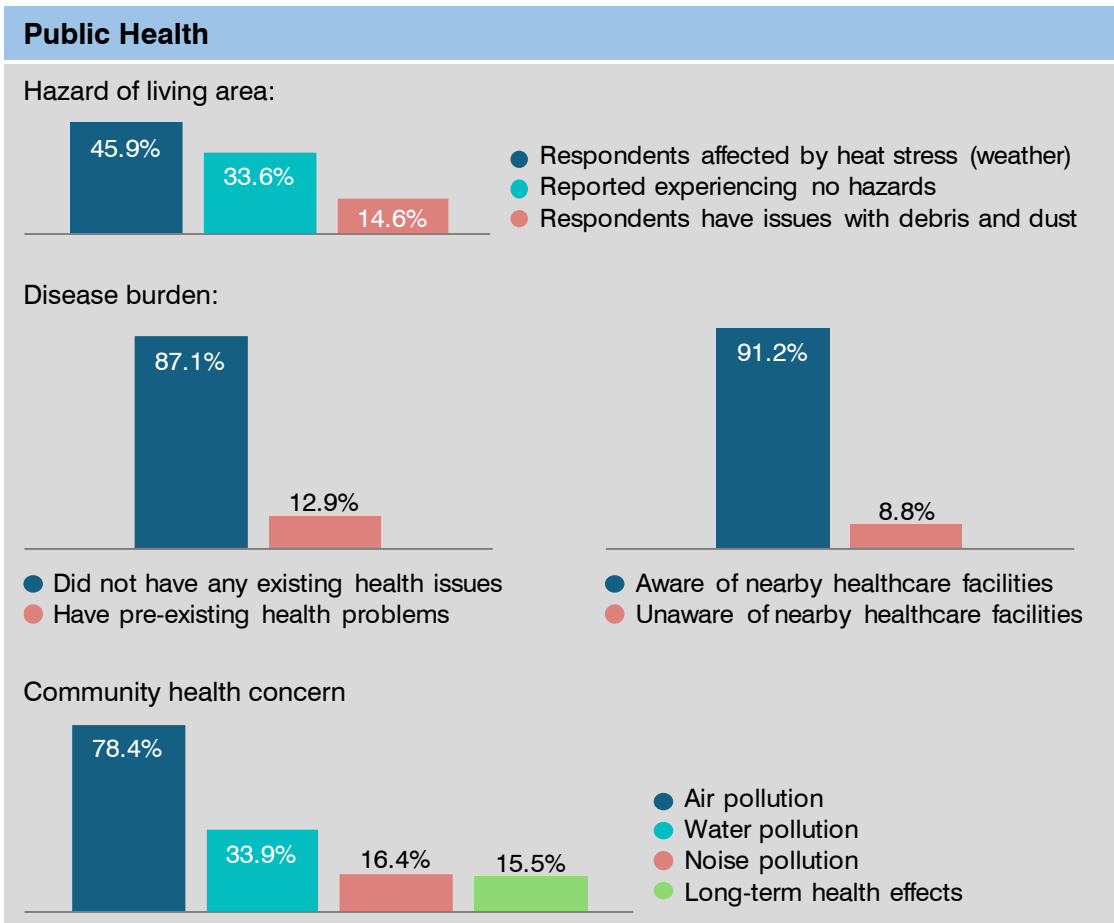
Consideration aspect towards the project (majority marked 'Agree' and 'Strongly Agree'):



- The project benefits local in terms of employment and income
- Beneficial only to the source of income of the State Government
- Does not bring any benefit to the communities
- Concerns on long-term health risks

Acceptance of the proposed project:





ENVIRONMENTALLY SENSITIVE AREAS (ESAs)

- RANK 1** Balok Permanent Reserved Forest
- RANK 2** 9 tributaries; Peat land –north of GIE
- RANK 3** Groundwater area – along the coastal area; Beach – Pantai Sungai Ular
- OTHERS** Settlements; Recreational areas; Eroded shoreline; Educational institutions; Mosques/*Surau*; Quarters; Resorts

SUMMARY OF POTENTIAL IMPACTS & ITS ASSOCIATED P2M2

SURFACE WATER QUALITY



POTENTIAL IMPACTS

- Effluent discharge at maximum regulatory limits could impact Sungai Baluk's water quality
- Project's treated effluent is expected to remain well below these limits, indicating minimal impact
- Elevated chloride, sodium, and sulphate may alter the river's salinity
- Discharge of untreated effluent from an IETS failure could significantly degrade water quality

P2M2

- Conduct daily monitoring, specific study on impact on Sungai Baluk, and R&D to manage chloride, sulphate, phosphate, and sodium levels
- Utilise existing Stormwater Retention Pond (SRP) as emergency containment
- Install real-time monitoring and alarm system to manage discharge during emergencies

GROUNDWATER QUALITY



POTENTIAL IMPACTS

- Contaminant migration risk is mainly limited to nearby wells south and southwest of the site
- Minimal risk to distant areas (i.e., settlements) due to groundwater flow direction and natural attenuation
- Existing natural and engineered barriers provide effective protection
- Overall groundwater impact is minimal with current containment and monitoring measures

P2M2

- Monitor critical wells regularly to detect early contamination
- Implement rapid response plan for breaches or contaminant migration beyond containment

TSUNAMI & SEA LEVEL RISE



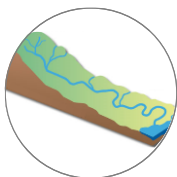
POTENTIAL IMPACTS

- The project area has a very low tsunami risk (Zone 2)
- Existing terrain and LAMP's engineering designs offer strong protection against sea level rise effects

P2M2

- No P2M2 is proposed

HYDROLOGY & DRAINAGE



POTENTIAL IMPACTS

- Will not cause any flood as LAMP's existing utilities and infrastructure (e.g., drainage systems and SRP) can accommodate the increase in effluent discharge volume

P2M2

- No P2M2 is proposed

NOISE & VIBRATION



POTENTIAL IMPACTS

- No significant impacts are expected as any noise and vibration produced will be localised and minimal during the LAMP operation

P2M2

- No P2M2 is proposed

AIR QUALITY



POTENTIAL IMPACTS

- The increase in LC processing capacity to 110,000 MT/year is not expected to raise emissions due to the existing APCS design
- Abnormal operation (APCS failure) showed elevated hydrogen chloride (HCl) emissions, though no limit exists for HCl under NMAAQS 2020

P2M2

- Operate new APCS for MREC in compliance with Environmental Quality (Clean Air) Regulations 2014
- Ensure stack emissions meet pollutant limits (e.g., particulate matter (PM) and HCl)
- Conduct continuous monitoring and performance checks by qualified personnel
- Comply with Regulation 24 to suspend operations during severe incidents
- Enhance system reliability and safety by upgrading backup power, automating emergency responses, improving real-time monitoring, and enforcing maintenance and training

RADIOLOGICAL LEVEL



POTENTIAL IMPACTS

The increase in LC processing to 110,000 MT/year is not expected to significantly impact workers or the public (based on the Radiological Impact Assessment (RIA) study done in 2017):

- Maximum radiation doses for workers and public remain well below safety limits, even in worst cases
- Off-site exposure decreases rapidly with distance, posing minimal risk
- Estimated cancer risks are insignificant compared to MOH data
- Safety measures and containment keep actual exposure far below worst-case predictions

P2M2

- LC is safely packed and transported under ATOM Malaysia-approved plans with radiation below public limits
- Air emissions are minimised by advanced treatment systems; continuous monitoring confirms low impact
- Acid and water are recycled in closed-loop systems to prevent discharge
- Waste is stored and disposed of in approved facilities with leak detection and monitoring
- NORM-contaminated waste is properly managed
- Regular radiological monitoring

**LAND
TRAFFIC****POTENTIAL IMPACTS**

- Minimal traffic impact is expected at main junctions
- Level of service (LOS) during peak hours will stay within acceptable limits (A to C)
- Nearby major roads have sufficient capacity for additional traffic
- Traffic analysis confirms acceptable LOS will continue with the project traffic

P2M2

- LC transportation will follow existing ATOM Malaysia-approved procedures
- MREC (non-radioactive) will be transported in 20-foot containers with sea-bulk liners, not classified as dangerous goods
- Develop standard operating procedures (SOP) for MREC transport covering accident emergency response plans (ERP), storage, processing, movement, and compliance with all relevant regulations and safety requirements

**AQUATIC
FAUNA****POTENTIAL IMPACTS**

- Elevated chloride and sodium may alter river salinity, but are likely tolerable by local species
- Phosphate and ammoniacal nitrogen risks are low
- Although heavy metals are detected in fish (existing condition), the treated effluent quality discharged is lower than the prescribed limits. Hence, no impact.

P2M2

- Regular water quality monitoring to prevent risks to aquatic life

**PUBLIC
HEALTH****POTENTIAL IMPACTS**

- Air quality hazard index is below 1.0, indicating low health risks
- Noise levels meet guidelines, posing minimal risk to nearby communities
- Groundwater quality is generally safe, with low contamination risks
- Fluoride levels slightly exceed river baseline, but remain below drinking water limits
- Heavy metals in fish pose low health risk; no impact expected from project's effluent

P2M2

- Continuous air and water quality monitoring
- Strengthened emergency plans and community communication
- Noise controls and daytime operation limits
- Groundwater protection with early warning systems
- Worker health measures, personal protective equipment (PPE), and hazard controls in place

SOCIO-ECONOMY



POTENTIAL IMPACTS

- Job opportunities viewed positively, but outsiders benefit more due to skill gaps
- Conflicts in corporate social responsibility (CSR) benefit distribution
- Concerns (moderate/high) over dust and radioactive pollution
- Water pollution concerns (low/moderate)
- Local youth face significant employment barriers

P2M2

- Prioritise qualified local communities on job openings
- Ensure fair CSR through stakeholder engagement
- Maintain pollution compliance through monitoring
- Educate public on radioactive concerns
- Promote R&D for sustainable by-product applications
- Support community development and education

WASTE MANAGEMENT



POTENTIAL IMPACTS

- On-site Secure Landfill capacity (5.5 million MT) is insufficient for the total NUF by-product to be generated (16% increase)
- Disposal of excess radioactive WLP at the existing off-site PDF and on-site RSF is insufficient

P2M2

- Use NUF as an Alternative Backfill Material (ABM)
- Develop and operate the first cell of a Long-Term Storage Facility (LTSF) for NUF by January 2028
- Implement R&D initiatives to minimise the quantity of radioactive WLP as per latest licence condition
- Store excess WLP in the emptied on-site RSF once LTSF operates
- Transition to gradual production of non-radioactive by-products through ThX project starting March 2031

QUANTITATIVE RISK ASSESSMENT (QRA)



POTENTIAL IMPACTS

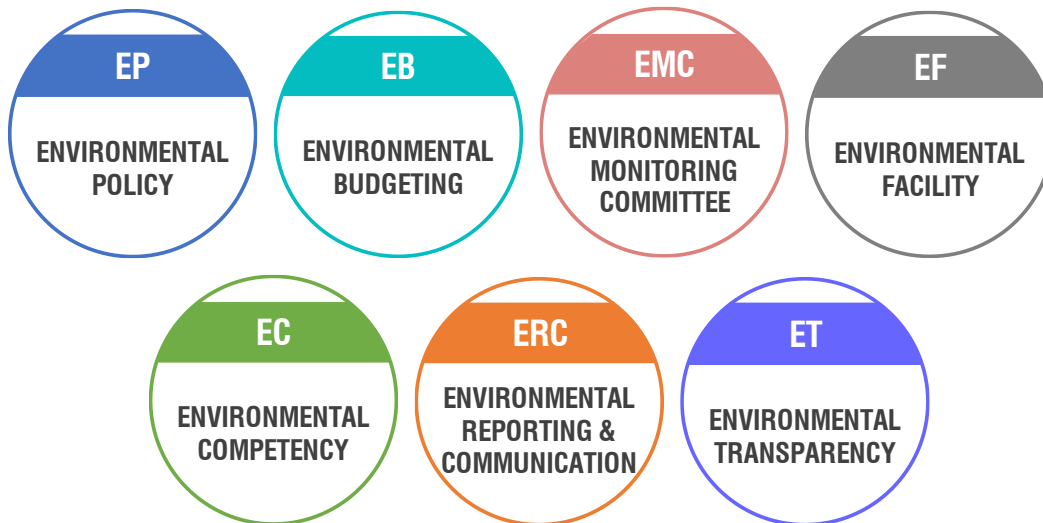
- Fire and explosion hazard zones for credible and worst-case scenarios stay within DOE risk limits and do not extend beyond the project boundary

P2M2

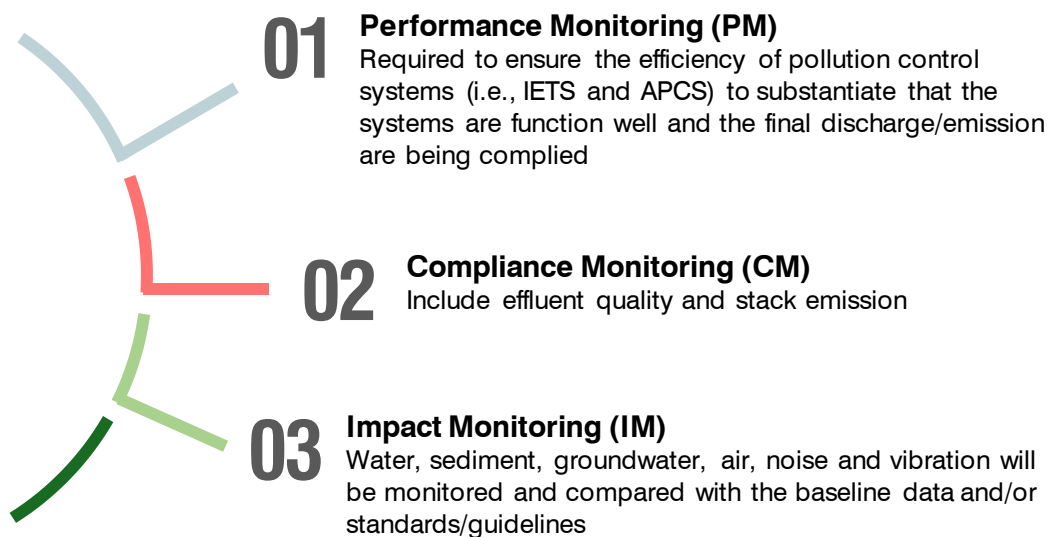
- No P2M2 is proposed

ENVIRONMENTAL MANAGEMENT PLAN

Environmental Mainstreaming Tools - Project Implementation



Environmental Monitoring Plan



Environmental Audit

To audit the compliance with the EIA approval conditions and the relevant environmental regulations and guidelines

EMERGENCY RESPONSE PLAN (ERP)



On-site emergency plans will be prepared to protect personnel and the public in terms of health, safety and environment in any case of an accident or natural disaster affecting or relating to the Project



Response to general accidents & occupational injuries



Response to fire & explosion



Response to hazardous & radioactive spill materials



Response to impact/collision (vehicle)



Response to external/natural events

STUDY FINDINGS

From the overall assessment, it can be concluded that:

01
The proposed project will not cause any significant impacts on the environment, evidenced by the various data collected since LAMP's commencement in 2012 and specific assessment done under this EIA

02

The Project Proponent shall diligently undertake all new mitigation measures that are suggested to further enhance its commitment in protecting the environment